

Achieving Sustainable Development Through Employees' Innovative Behaviour and Knowledge Management

Panteha Khodakarami*

International Business School, Universiti Teknologi Malaysia (UTM), Jalan Sultan Yahya Petra, 54100 Kuala Lumpur, Malaysia

Zukarnain Zakaria

Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia (UTM), Jalan Sultan Yahya Petra, 54100 Kuala Lumpur, Malaysia

Abdul Samad Kakar

International Business School, Universiti Teknologi Malaysia (UTM), Jalan Sultan Yahya Petra, 54100 Kuala Lumpur, Malaysia

Abstract

Recently, sustainable development has become an important factor for all companies and manufactures. From previous research reviews, it is understood that sustainable development (IISD) could be improved through effect of innovation. Past researches also indicated that increase in knowledge management (KM) can enhance innovation. This study investigated the relationship between knowledge management, innovation, and sustainable development in Malaysia's manufacturing sector. For this purpose, a survey was conducted to and addressed to a total of 123 employees of Proton Holdings Berhad. Findings from this study revealed that there is a significant relationship between the three variables mentioned; and the mediating role of innovative behaviour (IB) is accepted. This study contributes to the body of sustainable development literature. A particular implication for managers to take note is to invest in sustainable development through knowledge management and innovative behaviour.

Keywords: Sustainable development; Sustainability; Innovation; Innovative behaviour; knowledge management; Systematic Knowledge management strategy; Explicit knowledge; Tacit knowledge; Etutechgrp.



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1. Introduction

Sustainable development is best defined by growth rate that not only serve the interest of the present generation but also conserve the interest of future generation (WCED, 1987). Researchers, however, posit that there is always a trade-off between fast economic growth in both present and future (Pearce *et al.*, 2013). For instance, present economic development may decrease resources for future generation such as depletion of oil and natural resources and emergence of environmental issues.

In order to achieve SD, researchers are calling for a strategy that integrates sustainable development with innovation (Nunes *et al.*, 2016). However, since innovation requires resources, both conventional innovation and sustainable development innovation (SDI) are hindered by environmental and social pressures and the conservation of resources for future generation. This further complicated in case of SDI due to multiple interests among the stakeholders and various demands between parties involved. Amid this uncertainty, SDI has often been risky and difficult (Hall and Wagner, 2012).

Prior researchers found that sustainable development rests upon innovation (Melville, 2010; Schaltegger and Wagner, 2011; Seyfang and Smith, 2007) while innovation is dependent on knowledge (Asgharian *et al.*, 2013; Edquist, 2010; Wang *et al.*, 2013; Zhou and Li, 2012). Thus, the key ingredients for sustainable development are innovation and knowledge. This paper argues that through managing knowledge we can achieve both innovation and sustainable development. Our notion of the importance of knowledge for SD is also supported by Resource-Based View (RBV). According to Resource Based View, human resource (Knowledge) can improve organizational performance, which implies that human capital (knowledge) is beneficial to obtain competitive advantage (Barney, 1992).

Researchers also found that social capital such as knowledge, cultural norms, value and resources are significantly related to organisation performance (Seibert *et al.*, 2001). As such, RBV model supports the argument that resources are related to organization performance. Although the relationship between RBV and Social Capital to organisation performance has been investigated, studies that investigate the integrative role of Social capital theory and RBV model are limited. This paper argues that knowledge as a resource and social capital will result in employees' innovative behaviour and consequently will result in positive organisational outcomes (sustainable development).

In order to understand further the connection between sustainable development and innovation, Klewitz and Hansen (2014) encouraged the investigation of sustainable development in different industries and countries. Therefore, this paper intends to review the nexus between knowledge management, innovative behaviour and sustainable development with special reference in Malaysia's manufacturing sector.

This study contributes to literature in many ways. Firstly, it extends the existing literature by investigating the role of knowledge in sustainable development. Secondly, this paper investigates the role of innovative behaviour in sustainable development. And thirdly, this study examines the mediating role that innovative behaviour plays in the relationship between KM and SD, which to our knowledge is rarely investigated.

In addition, UN agenda for sustainable development goals in year 2030 Nations (2016) applies to all countries for cooperating in sustainable development to transform into a better world. "The new Goals are unique in that they call for action by all countries— poor, rich and middle-income—to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection" (Nations, 2016) Meanwhile, the Eleventh Malaysia Plan (2015) aims to achieve the status of developed nation characterised by high income, inclusiveness, and sustainability. Accordingly, a number of studies conducted in Malaysia regarding sustainable development such as Abdul *et al.* (2018), Barau (2015), (Foo, 2013), (Yiing *et al.*, 2013). However, unlike previous studies, this study investigates this issue more comprehensively by looking at the role of knowledge management and innovative behaviour on sustainable development in the perspective of Malaysian manufacturing industries, specifically Proton Berhad as a case.

2. Literature Review and Hypothesis Development

The concept of sustainable development as presented in the Broadlands Report (IISD, 1992; WCED, 1987) is referring to the development that satisfies present needs without depriving future generation from their rights and needs. In line with this, Eurostat (2016) stated that the objective of sustainable development is to ensure the quality of life for both current and future generations. Accordingly, achieving sustainable development has become one of the key challenges among policy makers globally. Meanwhile, academically, it has been the main objective of many contemporary researches with special focus on topics such as green development, economic depression and global warming.

2.1. Innovative Behavior and Sustainable Development

Finding an accurate definition for innovation is a challenging task since there is no standard and established definition as the word is vaguely defined, which caused uncertainty (Amabile, 1983; Brazeal and Herbert, 1999; Oldham and Cummings, 1997; Patterson, 2000). For instance, Zaltman *et al.* (1973) classified innovation into invention, process, and product, which is also referred to as creation, development, and marketing. Meanwhile, Grønhaug and Kaufmann (1988) summarized the definition of innovation in two concepts: Newness and advantageous.

Likewise, Gebert *et al.* (2010) studied innovation as an outcome variable at team level. Eisenbeiss *et al.* (2008) defined team innovation as development and implementation of quantity and quality of opinions among teams. Some researchers, such as Hülshager *et al.* (2009) and Taghipour and Dezfuli (2013) argued that the role of team process is of prime importance to further clarify and define team innovation and that the members of the team play a considerably significant role in succeeding to achieve team innovations.

Achieving innovation is seen as highly impossible task for an individual, thus the significance of the role of team work in creating innovation (Katzenbach and Smith, 2015). As a matter of fact, the perception of an organized team discussing and analysing ideas is seen to be more sensible and credible than one, where much of the tasks are done by an individual (Heunks, 1998). Scott and Bruce (1994) believed that individuals are highly motivated by innovative behaviour and this was supported by data analysis from a company's research and development centre in the USA. The findings of the analysis supported the idea that the best atmosphere for innovation enhances the innovative behaviour among employees.

In order to encourage innovative and innovation activities in the organizational, it is necessary to acknowledge that failures are tolerated during the innovation process and such failures are not punishable (Jung *et al.*, 2003) (Hartmann, 2006). In other words, innovation grows rapidly in organizations with high corporative and supportive culture coupled with low fear level (Shanker *et al.*, 2017). Therefore, the existence of an organization is important for changing creativity to innovation. In addition, innovation is also dependent on organizational beliefs, system and culture (Hamel, 2009).

Meanwhile, according to RBV as highlighted in Barney (1992), investments in human resources have impacts on organizational performance. Therefore, utilizing organizational resources with the objective to increase innovative behaviour (Camisón and Villar-López, 2014) can also impact sustainable development. This paper argues that if an organization aims to improve environmental, social and economic growth, innovation must play an integral part in achieving the objectives. Following this, in case of Malaysian manufacturing industry, the innovative behaviour will result in improved sustainable development. This paper proposes the following hypothesis:

H1: Innovative behaviour influences sustainable development significantly and positively.

2.2. Knowledge Management and Innovative Behavior

Knowledge management (KM) is increasingly considered as the key element in the integration between various resources and capacities, and continuous improvement of an organization (Geisler and Wickramasinghe, 2009; Obeidat *et al.*, 2016; Xiong and Deng, 2008). Knowledge management has also been considered as a key element in innovative behaviours (Tsai S., 2018). Many researches such as Asgharian *et al.* (2013), McKelvie *et al.* (2018),

Sadeghi and Rad (2018), Asgharian *et al.* (2013) Zhou and Li (2012), have demonstrated the relationship between knowledge (management, sharing and quality) and innovation.

Researchers have found that knowledge is a critical element for innovation (Tsai W., 2001). They also found that although one's knowledge level increases, they may experience difficulty to explain the knowledge efficiently or do not have enough resources to disseminate the knowledge to those who need it. Knowledge that can be captured, shared, managed and disseminate easily among people is known explicit knowledge or "rational knowledge" (Nonaka *et al.*, 1996).

With regards to this, Du (2007) stated that organizations can develop collaboration across the organizational boundaries to encourage innovation and to attain sustainable competitive advantage as it helps the organization to adopt new knowledge that can be helpful to fill the knowledge gap within the organization. This collaboration ultimately brings the innovation into the organization and can also reduce the risk and cost of the innovation.

Massa and Testa (2004) suggested that organizations should develop receptors in order to absorb or gain external knowledge. Specifically, companies should provide a channel where the employees can share their knowledge with each other. Organizations that quickly implement and capture new knowledge are able to improve innovation compared to firms that do not concentrate on this dimension Tamer *et al.* (2003). In addition, it is noted that the most important aspect of innovation is the capability to capture and identify organizational tacit knowledge (Du, 2007). In general, tacit knowledge can be acquired from external sources of an organization such as suppliers, customers and bankers. Tacit knowledge is also more important to industries with lesser explicit knowledge.

There are two types of knowledge that can be integrated by knowledge management. By means of integration, firms can understand which type of explicit and tacit knowledge can be substituted in the organization. In addition, some knowledge-related activities such as gathering, learning, managing, sharing, retrieval and reuse of knowledge have key roles in innovation. Prior researches have shown that knowledge management, knowledge transfer and learning are the factors that contribute to one's innovative behaviour (Lai *et al.*, 2016; Walker and Chou, 2018). Drawing upon the empirical result of the previous study, we argue that the innovative behaviour of an employee of a manufacturing company depends on the amount of knowledge they possess. Therefore, the second hypothesis of this study is as follows:

H2. Knowledge management influences innovative behaviour significantly and positively.

2.3. Knowledge Management and Sustainable Development

Knowledge is the key to sustainable competitive advantage (Nissen, 2018). Kates (2018) argued that sustainable development is the product of innovative mechanism and knowledge production. Kain and Söderberg (2008) noted that a wide range of knowledge among various stakeholders (e.g. groups experts, project manager, and project owner) have positive impact on the SD. Cash *et al.* (2003) argued that sustainable development not only depends on science (knowledge) and technology, but also on the interaction between knowledge and action. They found that knowledge leads to sustainability when it is applied in practical. Similarly, Clark *et al.* (2016) found that knowledge production often leads to sustainable development. Likewise, RBV posits that organisation performance rests on the amount of resource they possess. In other words, the organisation resources (knowledge) could influence organisation performance (sustainable development). Drawing upon RBV theories and empirical finding from previous studies, this study proposes the following hypothesis:

H3. Knowledge management positively influences sustainable development.

2.4 Mediating Role of Innovative Behaviour

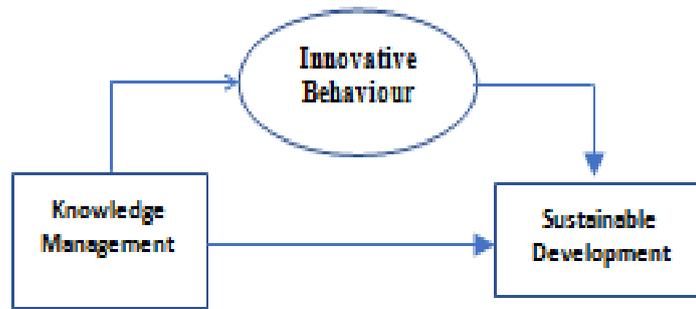
The relationship between knowledge management and sustainable development has been investigated by a number of researchers, for example, (Cash *et al.*, 2003), (Kain and Söderberg, 2008). However, only few studies investigated the mechanism through which KM is related to SD. This paper argues that employees' innovative behaviour acts as a mediating variable between KM and SD. This is based on the assumption that KM will enhance employee innovative behaviour, which in turn results in sustainable development. Behavioural theories posit that employee behaviour is the product of attitude, subjective norm and perceived behavioural control (Ajzen, 1991). Drawing upon Theory of Behavioural Control, this study argues that employee knowledge management (attitude) is positively related to their behaviours, hence the employees' performance (sustainable development). To verify this, the following hypothesis will be tested.

H4. Innovative behaviour mediates the relationship between knowledge management and sustainable development.

3. Framework of the Study

The objective of this study is to investigate the influence of KM as independent variable on sustainable development as the dependent variable. In this regard, employees' innovative behaviour plays the role of a mediator variable. The framework describing the relationship between the three variables studied is presented in Figure 1

Figure-1. Framework of the Study



4. Methods and Sampling Frame

This is a cross sectional study conducted to understand the impact of knowledge management and innovative behavior on sustainable development. The population of the study is employees of Proton Holdings Berhad, Kuala Lumpur, and the sample is selected using non-probability convenience sampling approach. Prior to final data collection, a pilot study on 30 respondents at Proton, Kuala Lumpur was conducted to ensure the reliability and validity of the constructs. Five-point Likert scale (1=strongly disagree, 5= strongly agree) is used to measure the constructs of the study. Finally, self-administered questionnaires were distributed to a total of 150 employees of Proton Holdings Berhad Malaysia and out of this, this study managed to gather 123 completed questionnaires.

4.1. Instruments Measurement

4.1.1. Innovative Behaviour

Innovation was measured with six items. The mediator variable of this study researches employees’ innovative behaviour regarding developing Human Resource in their company via training and educating (Scott and Bruce, 1994). Example of the item includes “I search out new technologies, processes, techniques, and/or product ideas”.

4.1.2. Knowledge Management

The variable asks about the beliefs of employees regarding the knowledge management in their company (Hsin-Jung, 2007). Knowledge management was measured using 10 items. Example of item is “In our company, knowledge like know-how, technical skill, or problem-solving methods is well organized”.

4.1.3. Sustainable Development

The variable asks about the perceptions of employees regarding sustainable development in their company (Garcia, 2006). Ten items used to measure the sustainable development. Example of item for sustainable development is “Our company currently strategy in place lead to sustainable development”.

5. Data Analysis

5.1. Descriptive Statistics

The data collected has been analyzed descriptively using SPSS 24. Table 1 summarizes the demographic profiles of the respondents.

Table-1. Respondent Demography profiles

No.	Demographic of Respondent	Frequency	Percentage
1 Gender	Female	32	31.1
	Male	91	68.9
2 Age	Under 25 years old	59	44.7
	26-35 years old	45	34.1
	36-55 years old	19	14.4
	Above 55 years old	-	-
3 working Experience	Under 5 years old	76	57.6
	6-10 years	17	12.9
	10-20 years	21	15.9
	Above 25 years	9	6.8
4 Education level	Some Secondary School	-	-
	Completed High School	7	5.3
	Undergraduate	71	53.8
	Postgraduate	45	34.1

5.2. Common Method Bias

All of the items of the construct were subjected to pilot study before final data collection. This paper applied procedural measures to avoid common method bias. Among others, the respondents were ensured that the survey and their identity are confidential. Similarly, caution was exercised to make sure the questionnaire was understandable to the respondent. Expert opinions were sought on the content and face validity of the construct. Finally, the questionnaire was distributed among respondents at Proton, Kuala Lumpur. The data was evaluated for suspicious outliers and missing values. In addition, the data was assessed for common method bias. The result shows that the total amount of variance explained by the variable of the study was less than 50%, thus common method bias is not an issue in this study.

To assess the reliability of the indicators and construct, the value Cronbach-alpha (α) was calculated. All the constructs were found reliable since the value of α for the respective constructs is greater than threshold value of 0.70. According to [Bagozzi and Yi \(1988\)](#), and [Hair et al. \(2011\)](#), α that is more than 0.70 represents the reliability of the constructs. Based on the results, we concluded that all constructs, IB, KM and SD are internally consistent.

Table-2. Reliability Result

Factorial Dimension	Number of Items	Cronbach's Alpha
Innovative Behavior (Seibert et al., 2001)	6	0.816
knowledge Management (KM)	10	0.860
Sustainable development (IISD)	10	0.865

5.3 Correlation Analysis

The main purpose of this study is to investigate the relationship between employees' innovative behavior and sustainable development. In this regard, the correlation analysis was conducted, and the results revealed that all constructs studied significantly correlate with each other. However, IB showed stronger correlation with KM than with SD, as shown in table 3.

Table-3. Correlation Result

Variable	Correlation Coefficient		Conclusion
	Pearson	Spearman	
KM, IB	0.600	0.542	Significantly Correlated
Sig.	(0.000)**	(0.000)**	
KM, SD	0.599	0.577	Significantly Correlated
Sig.	(0.000)**	(0.000)**	
IB, SD	0.235	0.236	Significantly Correlated
Sig.	(0.000)**	(0.000)**	

Note: ** significant at 1% level

5.4 Regression

In the next step, regression analysis was performed to test the hypotheses. This paper uses ([Baron and Kenny, 1986](#)) approach for hypothesis testing. According to [Baron and Kenny \(1986\)](#), for mediation to occur, the independent variable must have significant relationship with dependent variable and mediation variable. Likewise, mediating variable must significantly correlate with dependent variable. To assess whether mediation exist or not, four models were conducted.

Model-1. estimated the relationship between knowledge management on sustainable development. The results revealed that KM is significantly related to SD. H1 is supported.

Table-4. Model Summary KM on SD

Model	R	R Square	Adjusted R Square	F	Sig.
1	.599 ^a	.359	.354	67.814	.000 ^a

Table-5. Impact of KM on SD

Model	Coefficients		t	Sig.
	B	Std. Error		
(Constant)	1.476	.252	5.851	.000
Knowledge management	.583	.071	8.235	.000

Model 2 estimated the relationship between knowledge Management on IB. The result revealed that KM is significantly related to IB ($\beta=0.607$; $p < 0.05$). H2 is supported.

Table-6. Model Summary KM on IB

Model	R	R Square	Adjusted R Square	F	Sig.
1	.600 ^a	0.360	.0355	68.154	.000 ^a

Table-1. Impact of KM on IB

Model	Coefficient		t	Sig.
	B	Std.Error		
(Constant)	1.419	.262	5.412	.000
Knowledge Management	.607	.074	8.256	.000

Model 3 estimated the relationship between IB and SD. The result revealed that IB is significantly related to SD ($\beta=0.226$; $p < 0.05$).

Table-2. Model Summary IB on SD

Model	R	R. Square	Adjusted R. Square	F	Sig
1	0.600 ^a	0.360	0.355	7.048	.009

Table-9. Impact of IB on SD

Model	Coefficient		t	Sig.
	B	Std.Error		
(Constant)	2.724	.306	8.903	.000
Innovative Behaviour	.226	.085	2.655	.009

5.5. Testing Mediating Role on Innovative Behaviour

Since H1, H2, and H3 are supported, the primary assumptions of Baron and Kenny are met (Baron and Kenny, 1986). To test the mediating effect, two tailed tests were performed, and two models were regressed individually. In the first regression, the variable knowledge management was entered as the independent variable, while in the second regression, the innovative behavior is added to the regression as independent variable. The result of the regression are as follows in Table 10 & 11.

Table-10. Model Summary Mediating of IB

Model	R	R. Square	Adjusted R. Square	F	Sig
1	0.599 ^a	0.359	0.354	67.814	.000 ^a
2	.619 ^b	.384	.373	37.344	.000 ^b

Table-11. Mediating Role of IB Between KM &SD

Model	Coefficient		t	Sig.
	B	Std.Error		
(Constant)	1.476	.252	5.851	.000
Knowledge Management	.583	.071	8.235	.000
(Constant)	1.742	.277	6.295	.000
Knowledge Management	.697	.087	7.998	.000
Innovative Behaviour	-.188	.086	-2.183	.031

The regression results in Table 4 show that the R-square in first model is 0.359, while for the second model is 0.384. Therefore, R-square has increased (changed) by 0.025. The first model $F(1,120) = 67.814$ while the estimated value in second model shows $F(2, 119) = 37.344$, thus both of R-square values are statistically significant. Statistics in Table 11 also show that the impact of knowledge management is significant at 5% significant levels in the first model. In the second model, both knowledge management and innovative behavior are also significant. This shows that innovative behavior partially mediated the relationship between knowledge management and sustainable development, thus the fourth hypothesis is accepted.

6. Discussion

This paper provides additional understanding on the relationship between knowledge management, innovative behaviours and sustainable development. The relevant literatures stated that innovative behaviour can be closely related to sustainable development (Camisón and Villar-López, 2014). Also, knowledge management, which should be based on effective knowledge management, can enhance employee innovation in the workplace (Zhou and Li,

2012). Literature reviews also acknowledge that knowledge management effects sustainable development (Kain and Söderberg, 2008).

The result of this study revealed that employees' innovative behaviours is positively connected to the amount of knowledge they possess. Furthermore, the results revealed that employees' innovative behaviours lead to sustainable development. However, a particularly interesting finding from this study highlights the mediating role of innovative behaviours between knowledge management and sustainable development. The results revealed that innovative behavior mediate the relationship between knowledge management and sustainable development. Furthermore, the findings show that knowledge management could increase innovative behaviour, which in turn influence sustainable development. The findings of this study are in line with RBV and Social capital theory.

7. Conclusion

Sustainable development is one of the critical issues in all industries. Recent studies have emphasized three important aspects of sustainable development. These three aspects are social, economic and environmental. Therefore, for companies, in addition to economic growth, they should also consider society and the environment. One of the important factors that can contribute to the achievement of sustainable development is innovation. Increasing innovation, according to previous studies, is depend on utilizing knowledge (Tsai W., 2001). It can be said that through managing knowledge we can improve innovation and achieving sustainable development. Contribution of this study to organizations is mediating role of innovative behaviour between knowledge management and sustainable development. In other words, in order to enhance sustainable development, knowledge management should find its path via organizational innovative behaviour.

Manufacturing industry (Gylfason and Zoega, 2006), innovation and sustainable development (Garbie, 2014; Luo *et al.*, 2017) are vital for the economic growth of a country. This study focuses on the manufacturing sector of Malaysia. Future studies can test the framework of the current study in other industries especially in services industries. This study is conducted in Malaysia, while future studies can focus in other countries. In addition, future studies should also focus on to identifying the influential factors on knowledge sharing, knowledge storage and knowledge acquisition on innovative behaviour for improving this study's framework. In this study, the limitations of the survey method apply. The data collected from a limited number of respondents and extrapolate samples to populations.

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